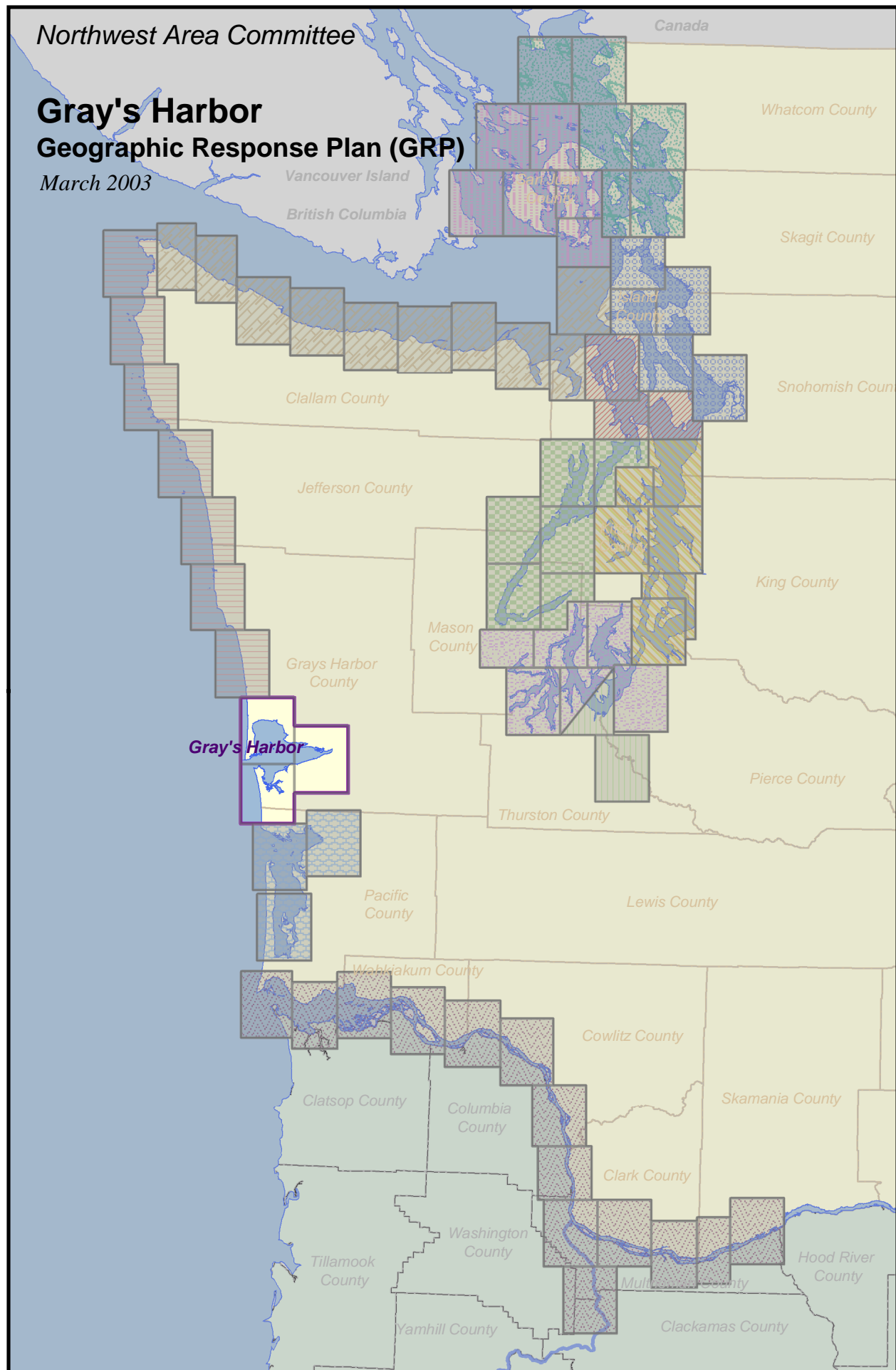


Northwest Area Committee

Gray's Harbor Geographic Response Plan (GRP)

March 2003



SPILL RESPONSE CONTACT SHEET

Required Notifications For Hazardous Substance or Oil Spills

USCG National Response Center.....	(800) 424-8802
In Oregon:	
Department of Emergency Management	(800) 452-0311
In Washington:	
Emergency Management Division.....	(800) 258-5990
Department of Ecology Northwest Regional Office.....	(425) 649-7000
Department of Ecology Southwest Regional Office.....	(360) 407-6300

U.S. Coast Guard

National Response Center	(800) 424-8802
Marine Safety Office Puget Sound:	
Watchstander	(206) 217-6232
Safety Office	(206) 217-6232
Marine Safety Office Portland:	
Watchstander	(503) 240-9301
Safety Office	(503) 240-9379
Pacific Strike Team	(415) 883-3311
District 13:	
MEP/drat	(206) 220-7210
Command Center	(206) 220-7001
Public Affairs	(206) 220-7237
Vessel Traffic Service (VTS)	(206) 217-6050

Environmental Protection Agency (EPA)

Region 10 Spill Response	(206) 553-1263
Washington Ops Office	(360) 753-9083
Oregon Ops Office	(503) 326-3250
Idaho Ops Office	(208) 334-1450
RCRA/ CERCLA Hotline	(800) 424-9346
Public Affairs	(206) 553-1203

National Oceanic Atmosphere Administration

Scientific Support Coordination	(206) 526-6829
Weather	(206) 526-6087

Canadian

Marine Emergency Ops/Vessel Traffic	(604) 666-6011
Environmental Protection	(604) 666-6100
B.C. Environment	(604) 356-7721

Department of Interior

Environmental Affairs	(503) 231-6157
	(503) 621-3682

U.S. Navy

Naval Shipyard	(360) 476-3466
Naval Base Seattle	(360) 315-5440
Supervisor of Salvage	(202) 695-0231

Army Corps of Engineers

Hazards to Navigation	(206) 764-3400
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Federal O.S.R.O./

State Approved Response Contractors

All Out Indust. & Env. Services	(360) 414-8655
Certified Cleaning Services, Inc.	(253) 536-5500
Clean Sound Cooperative, Inc.	(425) 783-0908
Cowlitz Clean Sweep, Inc.	(360) 423-6316
FOSS Environmental	(800) 337-7455
Global Diving and Salvage	(206) 623-0621
Guardian Industrial Services, Inc.	(253) 536-0455
Matrix Service, Inc.	(360) 676-4905
MSRC	(425) 252-1300
National Response Corporation	(206) 340-2772
Tidewater Environmental	(503) 289-4274
	& (360) 695-8088

Washington State

Department of Ecology Headquarters	(360) 407-6900
Southwest Region	(360) 407-6300
Northwest Region	(425) 649-7000
Central Region	(509) 575-2490
Eastern Region	(509) 456-2926

Department of Fish and Wildlife	(360) 534-8233
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Emergency Management Division	(360) 438-8639
	(800) 258-5990

State Patrol

Bellevue	(425) 455-7700
Tacoma	(253) 536-6210
Bremerton	(360) 478-4646
Vancouver	(360) 260-6333

Oregon State

Department of Environmental Quality	(503) 229-5733
Emergency Management	(503) 378-6377
	(800) 452-0311

HOW TO USE THIS GEOGRAPHIC RESPONSE PLAN

Purpose of Geographic Response Plan (GRP)

This plan prioritizes resources to be protected and allows for immediate and proper action. By using this plan, the first responders to a spill can avoid the initial confusion that generally accompanies any spill.

Geographic Response Plans are used during the emergent phase of a spill which lasts from the time a spill occurs until the Unified Command is operating and/or the spill has been contained and cleaned up. Generally this lasts no more than 24 hours. The GRPs constitute the federal on-scene coordinators' and state on-scene coordinators' (Incident Commanders) "orders" during the emergent phase of the spill. During the project phase, the GRP will continue to be used, and the planned operation for the day will be found in the Incident Action Plan's Assignment List (ICS Form 204). The Assignment List is prepared in the Planning Section with input from natural resource trustees, the Incident Objectives (ICS Form 202), Operations Planning Worksheet (ICS Form 215), and Operations Section Chief.

Strategy Selection

Chapter 4 contains complete strategy descriptions in matrix form, response priorities, and strategy maps. The strategies depicted in Chapter 4 should be implemented as soon as possible, following the priority table in Section 2 with the "Potential Spill Origin" closest to the actual spill origin. These strategy deployment priorities may be modified by the Incident Commander(s) after reviewing on scene information, including: tides, currents, weather conditions, oil type, initial trajectories, etc.

It is assumed that control and containment at the source is the number one priority of any response. If, in the responder's best judgment, this type of response is infeasible then the priorities laid out in Chapter 4, Section 2 take precedence over containment and control.

It is important to note that strategies rely on the spill trajectory. A booming strategy listed as a high priority would not necessarily be implemented if the spill trajectory and booming location did not warrant action in that area. However, the priority tables should be followed until spill trajectory information becomes available, and modifications to the priority tables must be approved by the Incident Commander(s).

The strategies discussed in this GRP have been designed for use with persistent oils and may not be suitable for other petroleum or hazardous substance products. For hazardous substance spills, refer to the Northwest Area Contingency Plan, Chapter 7000.

Standardized Response Language

In order to avoid confusion in response terminology, this GRP uses standard National Interagency Incident Management System, Incident Command System (NIIMS, ICS) terminology and strategy names, which are defined in Appendix A, Table A-1 (e.g. diversion, containment, exclusion).

GRAYS HARBOR

Geographic Response Plan

Record of Changes

[illegible]

Grays Harbor Geographic Response Plan Table of Contents

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Grays Harbor, WA

GEOGRAPHIC RESPONSE PLAN

1. INTRODUCTION: SCOPE OF THIS PROJECT

Geographic Response Plans are intended to help the first responders to a spill avoid the initial confusion that generally accompanies any spill. This document serves as the federal and state on-scene-coordinators “orders” during a spill in the area covered by this GRP (see Chapter 3 for area covered). As such, it has been approved by the U.S. Coast Guard Marine Safety Office and the Washington State Department of Ecology Spills Program. Changes to this document are expected as more testing is conducted through drills, site visits, and actual use in spill situations. To submit comments, corrections, or suggestions please refer to Appendix C.

GRPs have been developed for the marine and inland waters of Washington, Oregon, and Idaho. They are prepared through the efforts and cooperation of the Washington Department of Ecology, Washington Department of Fish and Wildlife, Oregon Department of Environmental Quality, Idaho State Emergency Response Commission, the U.S. Coast Guard, the Environmental Protection Agency, tribes, other state and federal agencies, response organizations, and local emergency responders.

GRPs were developed through workshops involving federal, state, and local oil spill emergency response experts, response contractors, and representatives from tribes, industry, ports, environmental organizations, and pilots. Workshop participants identified resources which require protection, developed operational strategies, and pinpointed logistical support. A similar process has been used for major updates.

Following the workshops, the data gathered was processed and reproduced in the form of maps and matrices which appear in Chapters 4 through 6. The maps in Chapters 5 and 6 were generated using Canvas. Maps for Chapter 4 were generated using ArcView GIS. The matrices were created using MS Excel, and the balance of each GRP was produced using MS Word.

The first goal of a GRP was to identify, with the assistance of the Washington State Natural Resource Damage Assessment Team, resources needing protection; response resources (boom, boat ramps, vessels, etc.) needed, site access and staging, tribal and local response community contacts, and local conditions (e.g. physical features, hydrology, currents and tides, winds and climate) that may affect response strategies. Note that GRPs only address protection of sensitive **public** resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

Secondly, response strategies were developed based on the sensitive resources noted, hydrology, and climatic considerations. Individual response strategies identify the amount of boom necessary for implementation. The response strategies are then applied to Potential Spill Origins and trajectory modeling, and prioritized, taking into account factors such as resource sensitivity, feasibility, wind, and tidal conditions.

Draft strategy maps and matrices were sent out for review and consideration of strategy viability. Field verification was conducted for some strategies, and changes proposed by the participants were included in a semi-final draft, which was offered for final review to all interested parties and the participants of the field verification.

Finally, the general text of the GRP was compiled along with the site description, reference maps, and logistical support.

Items included in Logistical Support:

- Location of operations center for the central response organization;
- Local equipment and trained personnel;
- Local facilities and services and appropriate contacts for each;
- Site access & contacts;
- Staging areas;
- Helicopter and air support;
- Local experts;
- Volunteer organizations;
- Potential wildlife rehabilitation centers;
- Marinas, docks, piers, and boat ramps;
- Potential interim storage locations, permitting process;
- Damaged vessel safehavens;
- Vessel repairs & cleaning;
- Response times for bringing equipment in from other areas.

2. SITE DESCRIPTION

The Grays Harbor estuary, situated along the southern coast of Washington, includes 62,000 acres of water, tidal marsh, and partially developed shoreline. Grays Harbor is bounded by Montesano to the east, Point Brown at the north mouth, and Westhaven at the south mouth. It is Washington state's largest port outside of Puget Sound. The region is served by rail from the east, highway linkages from the east, south, and north, by a 5,000-foot-runway airport, and by a -30 feet mean lower low water navigation channel.¹

Grays Harbor supports more than 50 species of fish, large populations of clams, oysters, and crabs, as well as 325 species of birds. The economies of six cities and towns depend upon shorefront industries such as ports, timber processing, fishing, and recreation.² Refer to Chapter 6 for detailed resource information.

2.1. Physical Features

The 91 square mile estuary is approximately 13 miles at its widest point and narrows to less than 100 yards at its upper reach, nearly 32 miles from the estuary mouth. The estuary is a drowned portion of the Chehalis River Valley, and is continually filled in with riverborne sediments and oceanic materials. The predominant physical feature of the estuary is the vast amount of intertidal mud and sandflats.

The three corners of the estuary are defined by the mouth of the Chehalis River to the East, the North Bay, which receives waters from the Humptulips River, and the South Bay, into which the Elk and Johns Rivers flow. The four major islands of the estuary are Goose and Sand Islands (North Bay), Whitcomb Island (South Bay), and Rennie Island, near the mouth of the Chehalis.³

2.2. Hydrology

Grays Harbor Estuary is fed by a 2,550 square mile drainage basin. Tributary rivers include the Chehalis, Hoquiam, Wishkah, Humptulips, Johns, and Elk River basins. The Chehalis is the largest and provides roughly 80% of the freshwater to the estuary. Net surface flow is seaward.

Due to winter storms, streams feeding Grays Harbor have higher winter flows and low summer flow. Seasonal freshwater input creates a range of salinity in the mid-portion of the estuary ranging from 5 parts per thousand during the winter to 20 parts per thousand in the summer.

The estuary contains numerous shallow channels created by ebb tide flows and river discharges. Historically, three main channels exist - the North, Middle, and South Channels. At present, the North Channel is dredged for navigation and the other two have shoaled to shallow depths.⁴

2.3. Currents and Tides

The depth of Grays Harbor averages less than 20 feet. At the harbor entrance depths reach a maximum of 80 feet. The surface area varies from 91 square miles at mean higher high water to about 38 square miles at mean lower low water, resulting in 53 miles of intertidal lands.

Grays Harbor is subject to the North Pacific's diurnal tide system (two high tides and two low tides daily). The upper limit of tidal influence is Montesano, approximately 32 miles from the harbor entrance. On an annual basis, the mean daily tidal range is 10 feet in the Aberdeen-Hoquiam area.

Tides move slowly up the estuary; high tide occurs 29 minutes later at Aberdeen than at the harbor mouth. Maximum mean velocities in the upper harbor vary from about 3 feet per second (fps) during flood tide to about 4.5 fps during ebb tide.⁵

2.4. Winds

Winter winds, with gusts ranging from 35 to 50 mph, are from the south to southwest. Spring and summer winds are from the west to northwest and are steadier with fewer gusts, with velocities ranging from 15 to 20 mph.⁶

If oil is spilled offshore, prevailing winds will play a role in spill direction, depending on the season. In the winter, the predominant winds are from the south and the current is circulating north. If oil is spilled offshore south of Grays Harbor, and it enters the mouth, it can be expected affect North Bay. If the spill does not enter Grays Harbor, the North Coast shoreline will be vulnerable. In the summer, the predominant winds are from the north. The summer winds are persistent, but not as strong as the winter winds. Oil may enter Willapa Bay or Grays Harbor from the north and spread south. The increasingly variably nature of the winds in the Spring, Summer, and Fall may reduce the predictability of the spill direction once it enters Grays Harbor.

2.5. Climate

The climate of the area is influenced by the Pacific Ocean. Grays Harbor has typically mild, dry summers and mild, wet, cloudy winters. August is the warmest month, with a mean average temperature of 70° F, while the coldest month, January, averages 34° F. Precipitation is high, increasing from about 80 inches near the estuary to over 220 inches in the higher reaches of the watershed.⁷

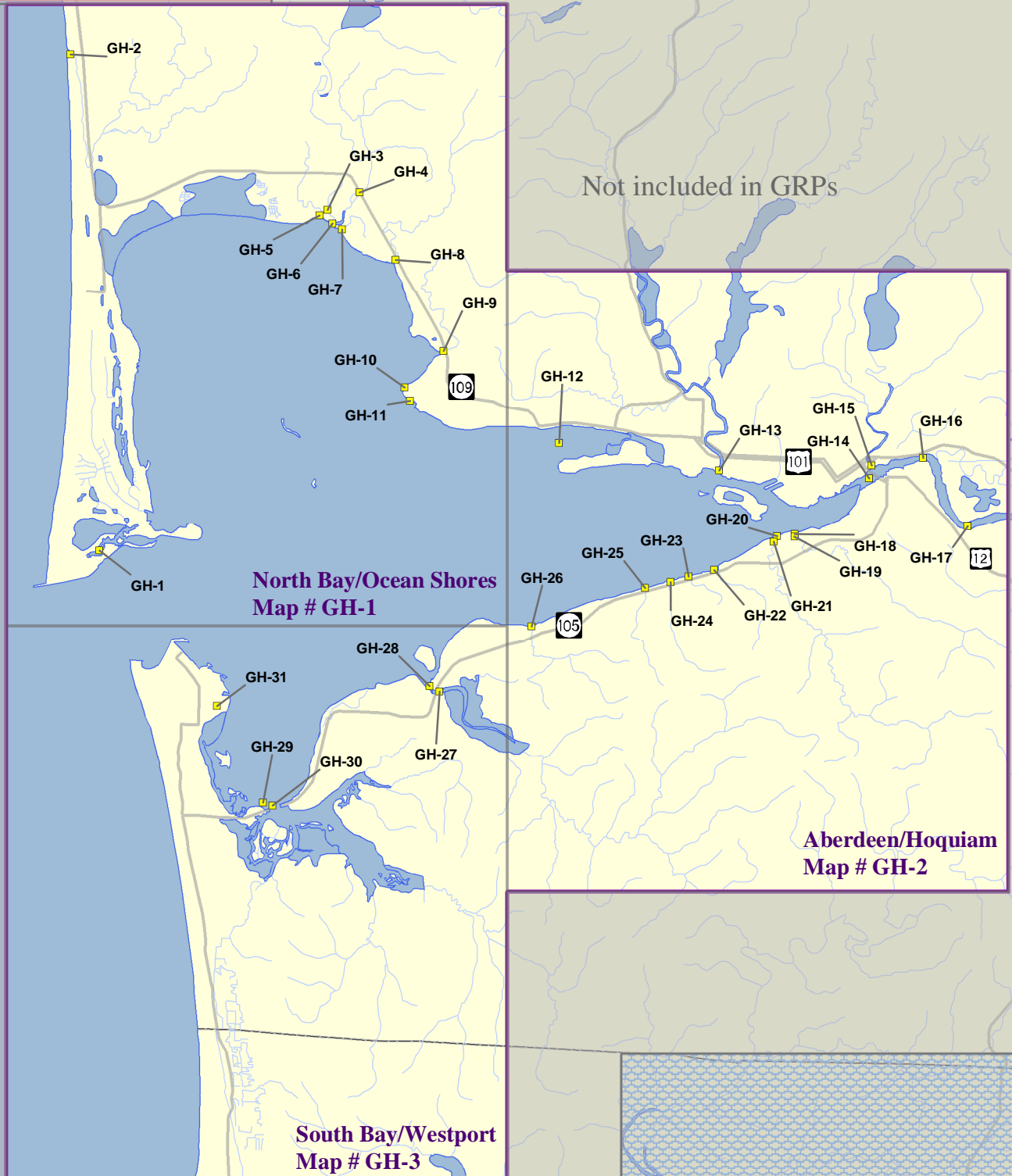
Gray's Harbor GRP Key Map

Booming Strategy Locations

March, 2003

Outer Coast GRP

Not included in GRPs



4. GENERAL PROTECTION/COLLECTION STRATEGIES

4.1. Chapter Overview

This chapter details the specific response strategies and resources to protect as outlined by the participants of the GRP workshop for the Grays Harbor area. It describes the strategies determined for each area and the prioritization of those strategies. Note that GRPs only address protection of sensitive **public** resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

Maps & Matrices

The maps in this chapter provide information on the specific location of booming strategies. They are designed to help the responder visualize response strategies. Details of each booming strategy are listed in corresponding matrix tables. Each matrix indicates the exact location, intent and implementation of the strategy indicated on the map. The "Status" column describes whether the strategy has been visited or tested in the field, and the date of the visit/test. Most strategies include a number for the corresponding shoreline photo, which is available on the Washington Department of Ecology's internet site at <http://www.ecy.wa.gov/apps/shorephotos/>.

Major Protection Techniques

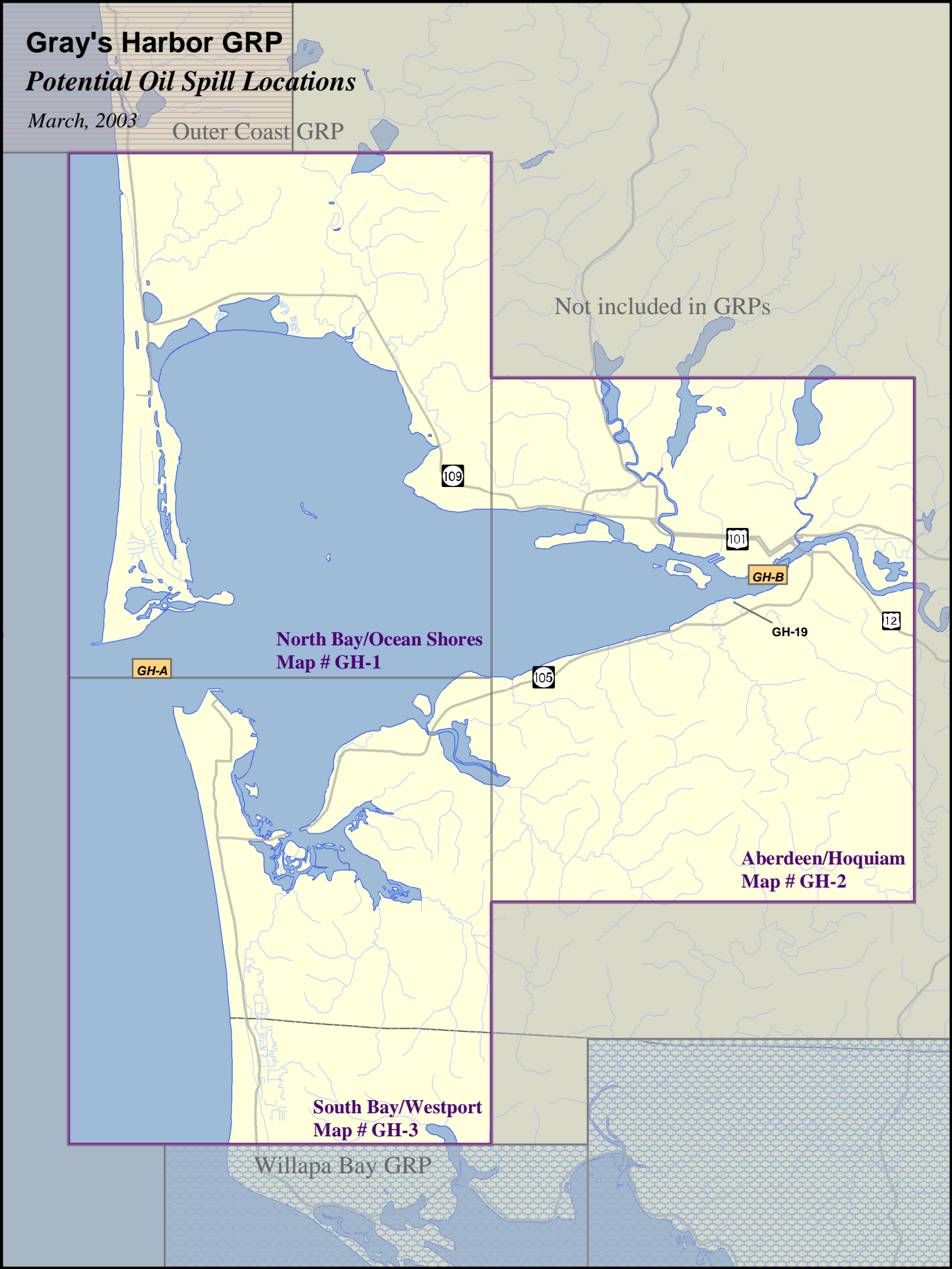
All response strategies fall into one of three major techniques that may be utilized either individually or in combination. The strategies listed in Section 4.2 are based on the following techniques, and are explained in detail in Section 4.3:

Dispersants: Washington State Policy currently does not allow use of dispersants in this area. Certain chemicals break up slicks on the water. Dispersants can decrease the severity of a spill by speeding the dissipation of certain oil types. Their use will require approval of the Unified Command. Dispersants will only be used in offshore situations under certain conditions, until further determinations are made by the Area Committee and published in the Area Contingency Plan.

In Situ Burning: Approval to burn in this area is unlikely due to the proximity of population to a potential burn site. Burning requires the authorization of the Unified Command, who determine conformance of a request to burn with the guidelines set forth in the Area Plan. This option is preferable to allowing a slick to reach the shore provided that population areas are not exposed to excessive smoke. Under the right atmospheric conditions, a burn can be safely conducted in relative close proximity to human population. This method works on many types of oil, and requires special equipment including a fire boom and igniters.

Mechanical Recovery and Protection Strategies: If a spill is too close to shore to use In Situ burning or dispersants, the key strategies are skimming and use of collection, diversion, or exclusion booming to contain and recover the oil, and prevent it from entering areas with sensitive wildlife and fisheries resources. These options are described in detail in Appendix A. Specific skimming strategies are not listed in the maps and matrices, but skimming should be used whenever possible and is often the primary means of recovering oil and protecting resources, especially when booming is not possible or feasible.

Priorities: The strategy priority tables (Section 4.2.) were developed using specific locations where spills are likely to occur. Trajectory modeling was used for each of these "Potential Spill Origins" to identify sensitive resources that would likely be impacted within the initial hours of the spill. A booming strategy priority table was developed for each of the "Potential Spill Origins" based on the sensitivity of resources, feasibility, etc. **Booming strategies should be deployed following the priority table for the "Potential Spill Origin" closest to the actual spill origin.** The map on page 4-2 shows the locations of all Potential Spill Origins for the Grays Harbor GRP. The booming strategies indicated in the priority tables are explained in detail in the Maps & Matrices section (Section 4.3.). It is implied that control and containment at the source is the number one priority of any response. If in the responder's best judgment this is not feasible, then the priorities laid out in the priority tables take precedence over containment and control.



4.2.2 Booming Strategy Priority Tables

Table 4-1

Potential Spill Origin: GH-A - Oil entering Grays Harbor on a flood tide from source outside of bay			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	GH-12	4-6	
2	GH-1	4-5	
3	GH-31	4-7	Tide Gate
4	GH-29	4-7	
5	GH-30	4-7	
6	GH-27	4-7	
7	GH-28	4-7	
8	GH-9	4-5	
9	GH-10	4-5	
10	GH-11	4-5	
11	GH-7	4-5	
12	GH-6	4-5	
13	GH-5	4-5	
14	GH-3	4-5	
15	GH-4	4-5	High water strategy
16	GH-8	4-5	
17	GH-14	4-6	
18	GH-13	4-6	

Table 4-2

Potential Spill Origin: GH-B - Oil entering Grays Harbor on an ebb tide from a source in the Chehalis River			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	GH-16		As needed to contain/control source
2	GH-17		As needed to contain/control source
3	GH-14		As needed to contain/control source
4	GH-15		
5	GH-12		
6	GH-1		
7	GH-19		
8	GH-18		
9	GH-21		
10	GH-20		
11	GH-22		
12	GH-23		
13	GH-24		
14	GH-25		
15	GH-26		

Proposed Booming Strategies

March, 2003

MAP # 1



Map below

2

3

Copalis Beach - Outer Coast GRP - Map # 7



Area not included in GRPs

Aberdeen/Hoquiam - Gray's Harbor GRP - Map # 2

South Bay/Westport - Gray's Harbor GRP - Map # 3

ABERDEEN/HOQUIAM

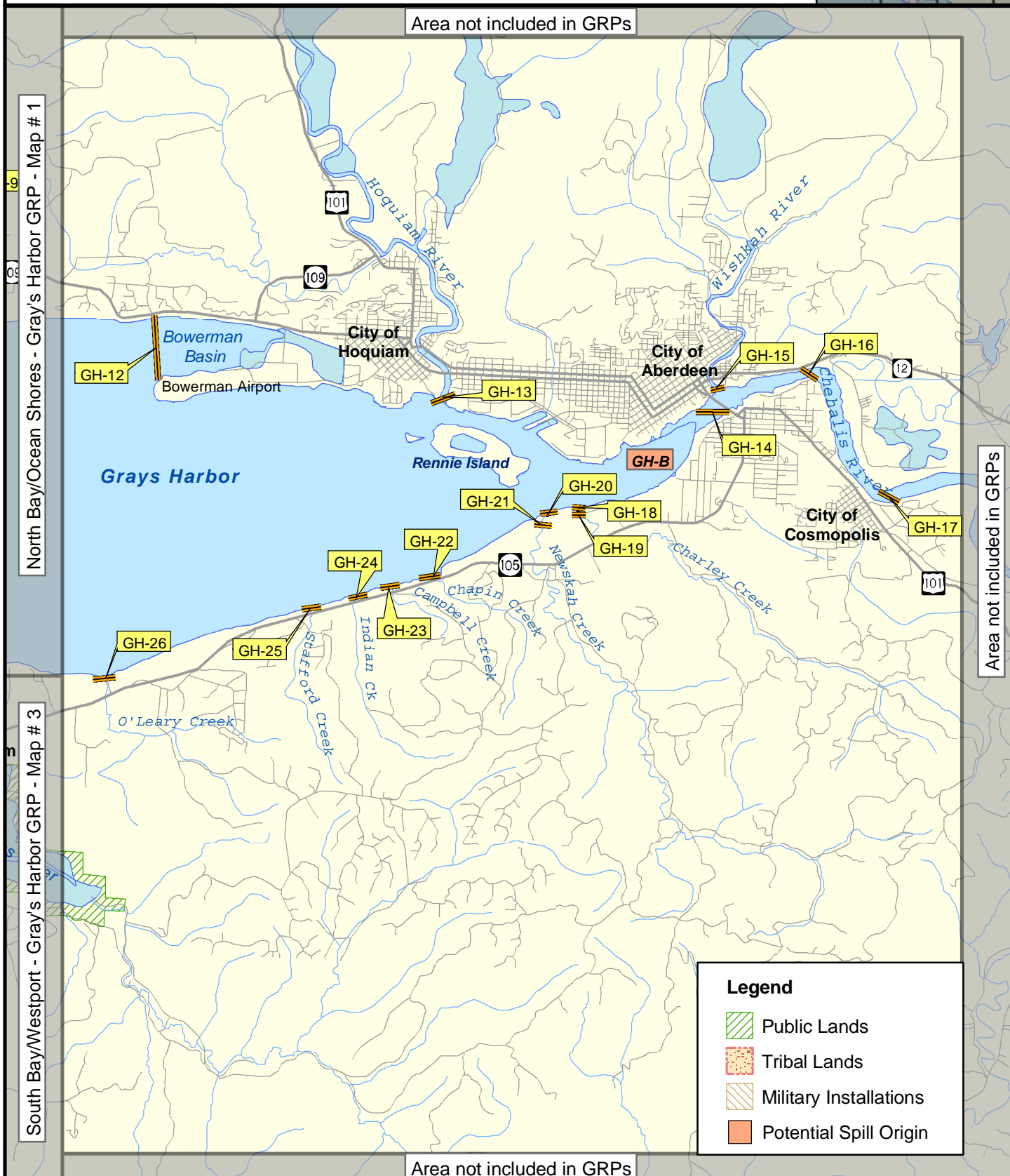
Proposed Booming Strategies

March, 2003

Gray's Harbor GRP

MAP # 2

0 0.5 1 2 Miles



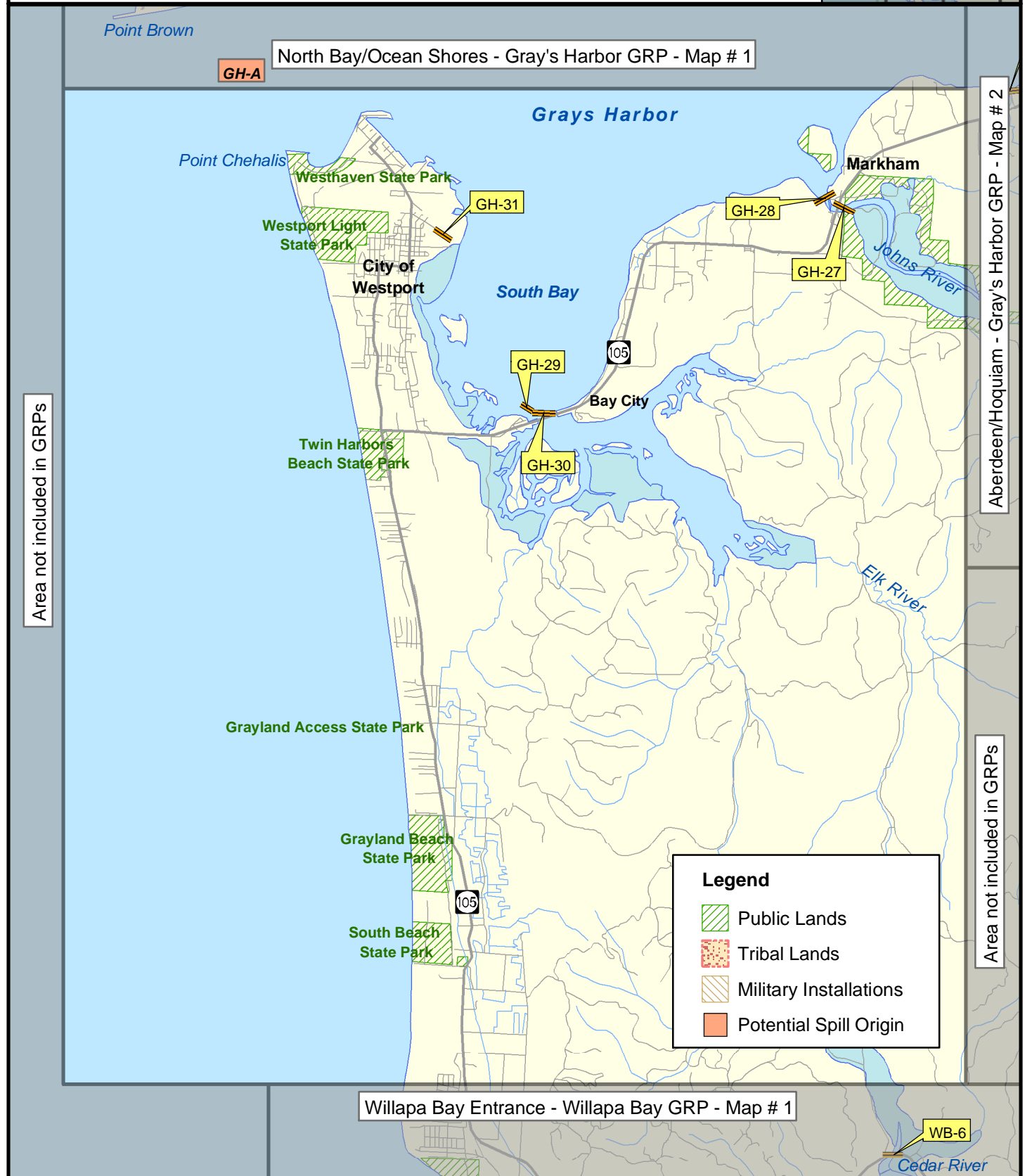
SOUTH BAY/WESTPORT

Proposed Booming Strategies

March, 2003

Gray's Harbor GRP

MAP # 3



4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-1		Ohyut Sink GRA0157 46°-56.405'N 124°-08.684'W	Exclusion - Keep oil out of salt marsh.	2000'	Install boom across entrance to marsh. Sand spits at entrance are dynamic, and the position of the entrance is likely to change, which may require more boom than what is listed here. Winter storms will impact the site.	Stage at Ocean Shores Marina parking lot.	Drive from Hoquium to Ocean Shores. Marina is at the south end of town.	Marshes, shorebirds, waterfowl.
GH-2		Conner Creek GRA0111 47°-05.590'N 124°-10.425'W	Exclusion - Keep oil out of Conner Creek.	400'	Deploy boom at an angle across the creek from the NW to the SE such that oil is recovered on the SE side.	Area south of Pacific Lane. Area can support large equipment. Permission would have to be obtained from owner/trustee.	1.2 mile north of Ocean City on 109, turn left on Pacific Ln into Sea View Estates. At the intersection of Ocean St. & Pacific Ln is a solid, unimproved road to Conner Creek.	Coho salmon, shorebirds.
GH-3		Humptulips River (Jessie Slough) 47°-02.627'N 124°-03.594'W	Exclusion - Keep oil from moving up Jessie Slough.	200'	Install boom across slough at Burrows Road crossing.	Stage at Burrows Road and Jessie Slough Crossing.	Deploy from bridge.	Salmon, steelhead, waterfowl and wetlands.
GH-4		Humptulips River 47°-03'N 124°-02.5'W	Exclusion - Keep oil from moving up Humptulips River. This is a high water strategy.	200'	Install boom across river at Hwy 109 crossing.	Stage at Hwy 109 and Humptulips River.	Deploy from bridge.	Salmon, steelhead, waterfowl and wetlands.
GH-5		Campbell Slough GRA0203 47°-02.717'N 124°-03.430'W	Exclusion - Keep oil from moving up Campbell Slough.	300'	Install boom across mouth of slough, south of Hwy 109. Use small work boat. Consider affects of high & low tide during deployment.	Stage at Hwy 109 and Jessie Slough Crossing.	Use work boat to float down river to deployment sites.	Salmon, steelhead, waterfowl and wetlands.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-6		Humptulips River and Jessie Slough GRA0204 47°-02.426'N 124°-03.249'W	Exclusion - Keep oil from moving up Humptulips River. Normal river flows during Oct - June will stop oil moving upstream.	1000'	Install boom across mouth of river, south of Hwy 109. Use small work boat.	Stage at Hwy 109 and Humptulips River.	Use work boat to float down river to deployment sites.	Salmon, steelhead, waterfowl and wetlands.
GH-7		Gillis Slough GRA0205 47°-02.411'N 124°-02.915'W	Exclusion - Keep oil from moving up Gillis Slough.	500'	Install boom across mouth of slough, south of Hwy 109. Use small work boat.	Stage at Hwy 109 and Humptulips River.	Use work boat to float down river to deployment sites.	Salmon, steelhead, waterfowl and wetlands.
GH-8		Chenois Creek GRA0208 47°-01.851'N 124°-01.559'W	Exclusion - Keep oil from moving up Chenois Creek.	300'	Install boom across creek west of Hwy 109 bridge. Deploy from bank.	Stage at Chenois Creek/Hwy 109 bridge crossing.	Take Hwy 109 west from Hoquiam to Chenois Creek.	Salmon, steelhead, waterfowl and wetlands.
GH-9		Grass Creek GRA0219 47°-0.25'N 124°-0.25'W	Exclusion - Keep oil from moving up Grass Creek.	200'	Install boom across mouth of creek just west of railroad bridge.	Stage at Grass Creek.	Take Hwy 109 west from Hoquiam to Grass Creek.	Sensitive nesting sites, waterfowl, shorebirds, marshes and wetlands.
GH-10		Point New Salt Marsh GRA0223 46°-59.263'N 124°-0.836'W	Exclusion - Keep oil from moving into Salt Marshes.	300'	Install booms across entrance to salt marshes. Helicopter deployment is required at low water.	Stage at Grass Creek.	Take Hwy 109 west from Hoquiam to Grass Creek.	Sensitive nesting sites, waterfowl, shorebirds, marshes and wetlands.
GH-11		Point New Salt Marsh GRA0224 46°-59.518'N 124°-01.150'W	Exclusion - Keep oil from moving into Salt Marshes.	1000'	Install booms across entrance to salt marshes. Helicopter deployment is required at low water.	Stage at Grass Creek.	Take Hwy 109 west from Hoquiam to Grass Creek.	Sensitive nesting sites, waterfowl, shorebirds, marshes and wetlands.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-12		Bowerman Basin GRA0243 46°-58.374'N 123°-56.896'W	Exclusion - Keep oil out of inner Bowerman Basin.	4000'	Install boom across basin on west side of piles. Booms must be installed at half tide (either ebb or flood). Piles are not exposed at high tide, and the basin goes dry at low tide.	Stage at west end of Bowerman Airport.	Drive to Hoquiam then to Bowerman Airport.	Sensitive nesting sites, waterfowl, shorebirds, marshes and wetlands.
GH-13		Hoquiam River GRA0251 46°-58.299'N 123°-52.658'W	Exclusion/ Collection - Keep oil from moving up Hoquiam River.	800'	Install boom at angle across river just above mouth for collection on east shore.	Stage from paper mill site on east side of river.	From Aberdeen, drive west to Hoquiam. The paper mill is just east of river mouth.	Salmon, steelhead, waterfowl and wetlands.
GH-14		Chehalis River GRA0263 46°-58.193'N 123°-48.469'W	Exclusion/ Diversion/ Collection - Keep oil from moving up Chehalis River.	2000'	Install boom at 45-60 deg. angle across river for collection on the south shore.	Stage at marina just west of lumber mill in South Aberdeen.	In south Aberdeen - use marina just west of mill.	Salmon, steelhead, waterfowl and wetlands.
GH-15		Wishkah River GRA0263 46°-58.471'N 123°-48.626'W	Exclusion - Keep oil from moving up Wishkah River.	500'	Install boom across river near mouth.	Stage at marina just west of lumber mill in South Aberdeen.	In south Aberdeen - use marina just west of mill.	Salmon.
GH-16		Chehalis River 46°-58.608'N 123°-47.278'W	Exclusion/ Diversion/ Collection - Keep oil from moving up Chehalis River.	1000'	Install boom at 45 deg. angle to shoreline for collection on the south shore.	Stage at marina just west of lumber mill in South Aberdeen.	In south Aberdeen - use marina just west of mill.	Salmon, steelhead, waterfowl, shorebirds, marshes and wetlands.
GH-17		Chehalis River 46°-57.428'N 123°-45.692'W	Exclusion/ Diversion/ Collection - Keep oil from moving up Chehalis River.	1500'	Install boom at 45 deg. angle to shoreline for collection on the south shore.	Stage at Weyerhaeuser mill in Cosmopolis.	Drive east from Aberdeen to Cosmopolis on Hwy 101. The Weyerhaeuser mill is at east end of town.	Salmon, steelhead, waterfowl, shorebirds, marshes and wetlands.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-18		Charley Creek GRA0280 46°-57.167'N 123°-50.568'W	Exclusion - Keep oil from moving up Charley Creek.	100'	Install boom near creek mouth (north of old railroad bridge).	Stage at Site.	Take Hwy 105 out of Aberdeen to Port of Grays Harbor dike access road & follow to site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-19		Charley Creek GRA0280 46°-57.116'N 123°-50.560'W	Exclusion - Keep oil from moving up Charley Creek.	100'	Install boom on north side of old railroad bridge.	Stage at Site.	Take Hwy 105 out of Aberdeen to Port of Grays Harbor dike access road & follow to site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-20		Newskah Creek GRA0281 46°-57.097'N 123°-51.043'W	Exclusion - Keep oil from moving up Newskah Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Stage at Charley Creek Site (near GH-19).	Take Hwy 105 out of Aberdeen to Port of Grays Harbor dike access road & follow to near GH-19 site. Then follow old railroad bed to site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-21		Newskah Creek GRA0281 46°-57.004'N 123°-51.109'W	Exclusion - Keep oil from moving up Newskah Creek.	100'	Install boom on north side of old railroad bridge.	Stage at Charley Creek Site (near GH-19).	Take Hwy 105 out of Aberdeen to Port of Grays Harbor dike access road & follow to near GH-19 site. Then follow old railroad bed to site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-22		Chapin Creek GRA0286 46°-56.422'N 123°-52.655'W	Exclusion - Keep oil from moving up Chapin Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Park near site off of Hwy 105.	Take Hwy 105 out of Aberdeen to Chapin Creek. Will need GPS & good road map to find site.	Wetlands, sea run cutthroat, salmon, waterfowl.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-23		Campbell Creek GRA0287 46°-56.295'N 123°-53.274"W	Exclusion - Keep oil from moving up Campbell Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Park near site off of Hwy 105.	Take Hwy 105 out of Aberdeen to Campbell Creek. Will need GPS & good road map to find site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-24		Indian Creek GRA0289 46°-56.166'N 123°-53.844'W	Exclusion - Keep oil from moving up Indian Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Park near site off of Hwy 105.	Take Hwy 105 out of Aberdeen to Indian Creek. Will need GPS & good road map to find site.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-25		Stafford Creek GRA0290 46°-56.030'N 123°-54.490'W	Exclusion - Keep oil from moving up Stafford Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Park near site off of Hwy 105.	Take Hwy 105 out of Aberdeen - site is near Stafford Creek Prison.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-26		O'Leary Creek GRA0298 46°-55.258'N 122°-57.468'W	Exclusion - Keep oil from moving up O'Leary Creek.	100'	Install boom across creek mouth (north of old railroad bridge).	Stage near boom site by taking private road.	Take Hwy 105 out of Aberdeen to O'Leary Creek turn right on private road at creek.	Wetlands, sea run cutthroat, salmon, waterfowl.
GH-27	Field tested 1992	Johns River GRA0308 46°-54.065'N 124°-00.085'W	Exclusion - Keep oil from moving up Johns River.	600'	Install boom across river.	Boat ramp at private oyster company on north side of river before crossing Markham Bridge.	Drive from Aberdeen to Markham (Hwy 105) turn right into oyster business just before crossing bridge.	Salt Marsh, shorebirds, waterfowl, salmon.
GH-28		Johns River GRA0309 46°-54.015'N 123°-59.610'W	Exclusion/ Collection - Keep oil from moving up Johns River.	1000'	Install boom at angle from boat launch site on south shore to north end of bridge, collect oil at boat launch.	Boat ramp on south side of river.	Drive from Aberdeen to Markham (Hwy 105) cross bridge to launch ramp site.	Salt Marsh, shorebirds, waterfowl, salmon.

4.3.2 Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
GH-29		Elk River GRA0373 46°-51.801'N 124°-04.385'W	Diversion - Divert oil from shoreline to GH-30 for collection.	600'	Install boom using a small boat. Strong currents may make installation difficult.	Stage at Brady's Oysters, has a private ramp.	Drive from Aberdeen on Hwy 105 to Bay City bridge. Follow signs to Brady's Oysters.	Large saltmarsh, waterfowl, shorebirds, etc.
GH-30		Elk River GRA0326 46°-51.928'N 124°-04.576'W	Exclusion/ Collection - Keep oil from moving up Elk River.	1500'	Install boom at angle using small boat to collect oil at east side of bridge. Strong currents may make installation difficult.	Stage at Brady's Oysters, has a private ramp.	Drive from Aberdeen on Hwy 105 to Bay City bridge. Follow signs to Brady's Oysters.	Large saltmarsh, waterfowl, shorebirds, etc.
GH-31		Tide Gate @ Westport GRA0385 46°-53.5'N 124°-06.0'W	Exclusion - Keep oil from moving up drainage.	100'	Close tide gate, or install boom across drainage.	Stage along road at tide gate.	Take Highway 105 from Aberdeen to Westport. Go east on Pacific Ave. in Westport to site.	Shorebirds, waterfowl, saltmarsh.

APPENDICES

Appendix A: Summary of Protection Techniques

Protection Techniques	Description	Primary Logistical Requirements	Limitations
ONSHORE			
Beach Berms	A berm is constructed along the top of the mid-inter tidal zone from sediments excavated along the downgradient side. The berm should be covered with plastic or geo-textile sheeting to minimize wave erosion.	<ul style="list-style-type: none"> • Bulldozer/Motor grader -1 • Personnel - equipment operator & 1 worker • Misc. - plastic or geotextile sheeting 	<ul style="list-style-type: none"> • High wave energy • Large tidal range • Strong along shore currents
Geotextiles	A roll of geotextile, plastic sheeting, or other impermeable material is spread along the bottom of the supra-tidal zone & fastened to the underlying logs or stakes placed in the ground.	<ul style="list-style-type: none"> • Geotextile - 3 m wide rolls • Personnel - 5 • Misc. - stakes or tie-down cord 	<ul style="list-style-type: none"> • Low sloped shoreline • High spring tides • Large storms
Sorbent Barriers	A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes & filling the space between with loose sorbents.	Per 30 meters of barrier <ul style="list-style-type: none"> • Wire mesh - 70 m x 2 m • Stakes - 20 • Sorbents - 30 m² • Personnel - 2 • Misc. - fasteners, support lines, additional stakes, etc. 	<ul style="list-style-type: none"> • Waves > 25 cm • Currents > 0.5 m/s • Tidal range > 2 m
Inlet Dams	A dam is constructed across the channel using local soil or beach sediments to exclude oil from entering channel.	<ul style="list-style-type: none"> • Loader - 1 • Personnel - equipment operator & 1 worker or several workers w/shovels 	<ul style="list-style-type: none"> • Waves > 25 cm • Tidal range exceeding dam height • Freshwater outflow

NEARSHORE			
Containment Booming	Boom is deployed in a "U" shape in front of the oncoming slick. The ends of the booms are anchored by work boats or drogues. The oil is contained within the "U" & prevented from reaching the shore.	For 150 meters Slick: <ul style="list-style-type: none"> • Boom - 280 m • Boats - 2 • Personnel - boat crews & 4 boom tenders • Misc. - tow lines, drogues, connectors, etc. 	<ul style="list-style-type: none"> • High winds • Swells > 2 m • Breaking waves > 50 cm • Currents > 1.0 m/s
Exclusion Booming	Boom is deployed across or around sensitive areas & anchored in place. Approaching oil is deflected or contained by boom.	Per 300 meters of Boom <ul style="list-style-type: none"> • Boats - 1 • Personnel - boat crew & 3 boom tenders • Misc. - 6 anchors, anchor line, buoys, etc. 	<ul style="list-style-type: none"> • Currents > 0.5 m/s • Breaking waves > 50 cm • Water depth > 20 m
Deflection Booming	Boom is deployed from the shoreline away from the approaching slick & anchored or held in place with a work boat. Oil is deflected away from shoreline.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> • Boom - 60 m • Boats - 1 • Personnel - boat crew + 3 • Misc. - 3 anchors, line, buoys, recovery unit 	<ul style="list-style-type: none"> • Currents > 1.0 m/s • Breaking waves > 50 cm
Diversion Booming	Boom is deployed from the shoreline at an angle towards the approaching slick & anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> • Boom - 60 m • boats - 1 • Personnel - boat crew + 3 • Misc. - 3 anchors, line, buoys, recovery unit 	<ul style="list-style-type: none"> • Currents > 1.0 m/s • Breaking waves > 50 cm
Skimming	Self-propelled skimmers work back & forth along the leading edge of a windrow to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest oil concentration.	Self-propelled (None) Towed <ul style="list-style-type: none"> • Boom - 200 m • Boats - 2 • Personnel - boat crews & 4 boom tenders • Misc. - tow lines, bridles, connectors, etc. Portable <ul style="list-style-type: none"> • Hoses - 30 m discharge • Oil storage - 2000 liters 	<ul style="list-style-type: none"> • High winds • Swells > 2 m • Breaking waves > 50 cm • Currents > 1.0 m/s

Source is R. Miller of Clean Sound Cooperative.

Appendix B: Original Geographic Response Plan Contributors**Industry and Response Contractors**

Clean Sound Cooperative

Crowley Marina

Foss

Global Diving and Salvage

Island Oil Spill Association

Marine Spill Response Corporation

OHM

Port Townsend Paper Co.

Riedel Environmental

Wildlife Rapid Response Team, Inc.

Federal Representatives

U.S. Coast Guard

Marine Safety Office

District Response Assist Team

Pacific Strike Team

Environmental Protection Agency

U.S. Department of Interior

National Park Service

U.S. Department of Commerce

NOAA

Hazardous Materials Response Division

Sanctuary and Reserves Division

National Marine Fisheries Service

National Marine Mammal Laboratory

Fisheries Management Division

U.S. Army Corps of Engineers

Bureau of Indian Affairs

U.S. Fish and Wildlife Service

State Representatives

Wa. State Department of Community Development

Office of Archeology and Historic

Preservation

State Representatives (continued)

Washington State Department of Ecology

Oregon Department of Environmental Quality

Washington Department of Fish and Wildlife

Marine Oversight Board

Office of Marine Safety

Washington State Maritime Commission

Washington Department of Natural Resources

Parks and Recreation Commission

Puget Sound Water Quality Authority

Other

Coalition of Washington Ocean Fisherman

Northwest Indian Fisheries Commission

Point Defiance Aquarium

Seattle Aquarium

Environmental Consulting Firms

Battelle Marine Sciences Lab

Beak Consultants Inc.

Evans-Hamilton Inc.

Genwest Systems Inc.

Graham and Dunn

Environmental Advocacy Groups

American Oceans Campaign

Washington Environmental Council

Audubon Society

Trout Unlimited

Sierra Club

People for Puget Sound

Appendix C: Geographic Response Plan Comments/Corrections/Suggestions

If you have any questions regarding this document or find any errors, please notify one of the following agencies: or use tear out sheet (page C-3)

- Washington Department of Ecology, SPPR program, Natural Resources Unit
- USCG Marine Safety Office Puget Sound, Planning Department
- USCG Marine Safety Office Portland
- Oregon Department of Environmental Quality
- Idaho Emergency Response Commission
- Environmental Protection Agency Region 10

Phone Numbers:

Washington DOE	(360) 407-6972
USCG MSO Puget Sound	(206) 217-6213
USCG MSO Portland	(503) 240-9307
Oregon DEQ	(503) 229-5774
Idaho ERC	(208) 334-3263
EPA	(206) 553-6901

Bulletin Board System (BBS):

USCG MSO Puget Sound	(206) 217-6216
USCG MSO Portland	(503) 240-9308

Internet/E-mail Address:

WADOE	dald461@ecy.wa.gov
OR DEQ	WYLIE.Jack@deq.state.or.us
USCG MSO Puget Sound	jlehto@pacnorwest.uscg.mil
USCG MSO Portland	mwilcox@pacnorwest.uscg.mil
USEPA	sheldrake.beth@epamail.epa.gov

Address:

Commanding Officer United States Coast Guard MSO Puget Sound Planning Department 1519 Alaskan Way South Seattle, WA 98134-1192	Washington Department Of Ecology SPPR Program Natural Resources Unit P.O. Box 47600 Olympia, WA 98504-7600	Office Of The Governor Idaho Emergency Response Commission 1109 Main Statehouse Boise, ID 83720-7000
Commanding Officer United States Coast Guard Planning Department MSO Portland 6767 North Basin Ave Portland, OR 97217-3992	Oregon Department of Environmental Quality Water Quality Division 811 SW Sixth Avenue Portland, OR 97204	Environmental Protection Agency Emergency Response Branch 1200 Sixth Avenue Seattle, WA 98101

*Geographic Response Plan***Comments/Corrections/Suggestions****Directions:**

Fill in your name, address, agency, and phone number. Fill in the blanks regarding the location of information in the plan being commented on. Make comments in the space provided. Add extra sheets as necessary. Submit to: Dale Davis

Department of Ecology
Spills Program
300 Desmond Drive
P.O. Box 47600
Olympia, WA 98504-7600
dald461@ecy.wa.gov

Name:_____	Title:_____	Agency:_____
Address:_____		
City: _____	State/Province:_____	Zip/Postal Code:_____
Phone: (____) _____ E-Mail:_____		

GRP:_____	Page Number:_____
Location on page (chapter, section, paragraph) (e.g. 2.1, paragraph 3):_____	

Comments:_____

Northwest Area Committee
c/o Washington Department of
Ecology
Spills Program
Natural Resources Unit - GRP
Corrections
P.O. Box 47600
Olympia, WA 98504-7600